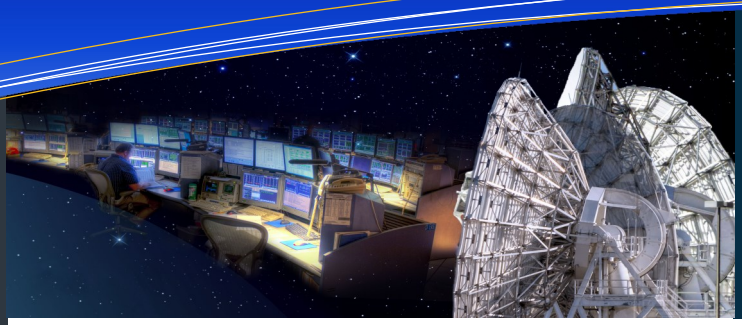
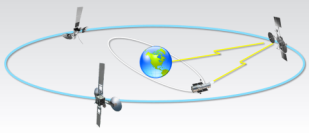
May 2016

Space Network Ground Segment Sustainment (SGSS) Newsletter



SGSS Goals and Objectives

- Provide a ground system that will allow the Space Network to provide reliable services
- Allow a reduction in the cost of operating and maintaining the Space Network
- Reduce communication costs for our customers
- Implement an extensible, flexible, and scalable ground terminal architecture
- Continue to provide existing Space Network functionality
- Enhance the continuity of operations posture of the Space Network
- Transition from the legacy system to the new SGSS system in a low risk environment
- Meet or exceed the legacy proficiency, performance, and availability requirements



SGSS Development Status Update

Since last fall, Increment A5 development has progressed with the goal of completing the Space Network Operations Center (SNOC), which began in Increment A4, along with the addition of Mission Operations Center (MOC) connectivity and initial User Services functionality. A Memorandum of Agreement (MoA) with the Communications Service Office (CSO) was established and an Authorization to Test (ATT) obtained. All software for Increment A5 is now complete and handed over to Development Integration & Test. Early 2016 saw the start of development for Increment A6.

As a result of budget constraints, activities and material purchases for the Blossom Point Ground Terminal (BPGT) and the Guam Remote Ground Terminal (GRGT) have been deferred. The project continues with planning for development, integration, testing, and deployment for the White Sands Complex.

SGSS Customer Technical Interchange Meeting (TIM)

An SGSS Customer Technical Interchange Meeting (TIM) took place on November 5th. The Customer TIM provides a forum for customers to get information on topics of interest and to provide feedback to the SGSS team. This past Customer TIM included information on the maturity of interfaces, early customer testing and updates to deployment and transition plans. The SGSS Customer TIM presentations are available at http://esc.gsfc.nasa.gov/space-communications/sgss/349.html.

The next Customer TIM is being planed for Summer 2016.

For additional information or to request topics for the Customer TIM, please contact Vir Thanvi (vir.thanvi@nasa.gov)

GENERAL DYNAMICS
Mission Systems

HARRIS

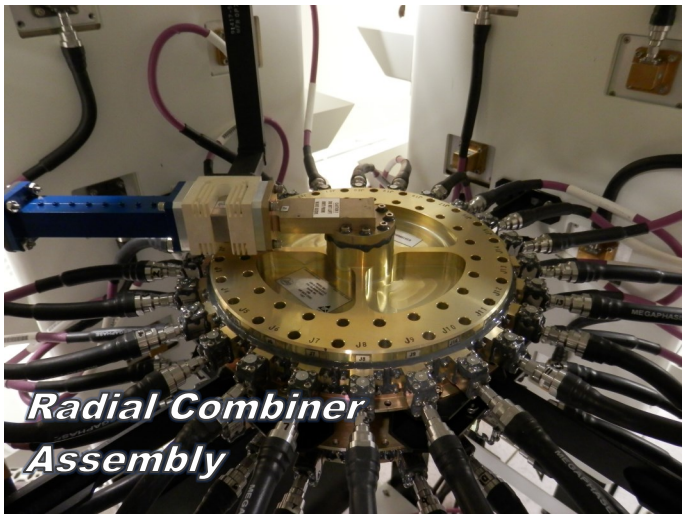
Increment A5 Highlights

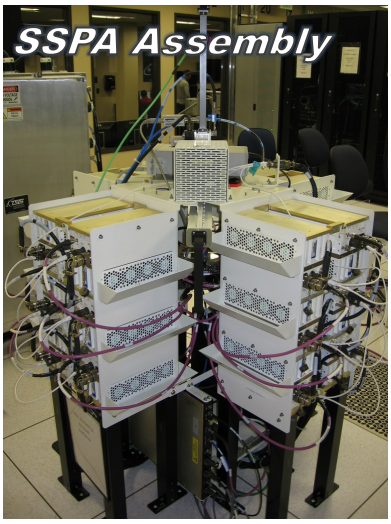
Since last September, SGSS has engaged in multiple activities to bring Increment A5 capabilities to fruition. Increment A5 System Integration and Test (SI&T) began with build up of the Second TDRS Ground Terminal (STGT) environment in the General Dynamics lab in Scottsdale AZ. In October, the Monitoring and Control (M&C) lab environment was finalized for STGT and initial external interface risk mitigation testing was performed with the Deep Space Network (DSN), Near Earth Network (NEN), Flight Dynamics Facility (FDF), and Communications Service Office (CSO). Other laboratory activities include the establishment of Remote Development Facility (RDF)-3 as a GRGT environment to support Increment A5 Development Integration & Test (DEVIT) testing and the refresh of the RDF-2 lab to support SI&T integration testing.

Handover from Development to Development I&T was completed for several functions, including:

* Digital Signal Processing (DSP) — Control, Test, and Monitor (CTM)
* Fleet and Ground Management Enterprise Management (FGM-EM)
* Maintenance and Training (MT) Maintenance and Analysis
* Service Management (SM) — Planning and Scheduling Services
* FGM-Telemetry Tracking and Command (TTC) — Local Flight Dynamics
* FGM-TTC — Telemetry Tracking and Command Control (TTCC)
* FGM-TTC — Mission Utilities (MU) Antenna Application
* Enterprise Infrastructure (EI) — CTM

In December, GD conducted integration of the first redesigned radial combiner production unit. NASA witnessed successful acceptance testing of the unit at Harris in Melbourne, FL, and it is being incorporated into the White Sands Ground Terminal (WSGT) South Main Mission Antenna (MMA) assembly in Scottsdale. The final Service Management (SM) Planning and Schedule Engine (PSE) demonstration of A5 functionality was held in January and presented the planned minimum SM PSE functionality. Additionally, the Level 2/3 Integration Test for the WSGT MMA Space-Ground Link (SGL) hardware at Harris was a success. Preparation and planning has also begun on the testing and shipment of shelters for the SGL hardware. In February, validation activities for the new Standard Gain Antenna Test Set (SGATS) were successfully performed at the BPGT.

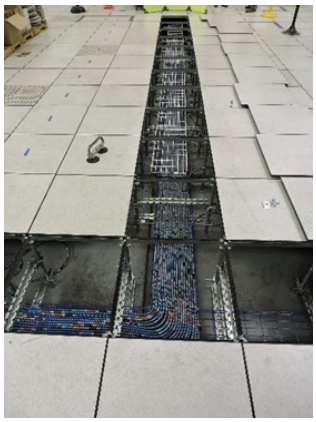




WSC Facility Modifications

The WSC Facility Modifications have begun! SGSS-planned modifications to the WSGT CDCN and GCE floor have been started with the installation of Cable Trays and Power installations including Core Drill efforts as well as essential power panels within the Waveguide Tunnel. These initial efforts set the facilities “ground work” to begin SGSS Installations.

CDCN Conduit Install



CDCN Power Installations

Waveguide UPS Safety

Core Drill Efforts

In addition to this, early integration efforts to install the Harris Deck Shelters on the WSGT MMAs have begun. This Deck Shelter will be housing the High Power Amplifier Array, three additional cabinets of SGL and DSP equipment along with two ECUs. Two additional Deck Shelters are scheduled for installation on the remaining two WSGT MMAs during the next several months.

Deck Shelters

Early Interface Testing

With the establishment of the STGT M&C lab environment mentioned above, Post-A4/Pre-A5 External Interface Testing with CSO, FDF, NEN, and DSN was successfully completed in December 2015. A refresh the of STGT environment to support Post-A5 External Interface Testing with user missions in early-July 2016 is underway.

Testing of the Earth Observing System (EOS) Data Operations System (EDOS) User Local Equipment (ULE) was performed in February. This risk reduction activity was mutually beneficial to SGSS and EDOS. The ULE successfully locked to data and processed the Terra data set that was provided by EDOS. All data statistics matched the baseline statistics gathered by EDOS personnel at GSFC, and all objectives were met.

SGSS has also established an agreement with Fermi for its participation in Post A5 Early Interface Testing (EIT) taking place in August.

Our thanks go out to the organizations and missions whose participation and cooperation have helped ensure that early testing has been successful and constructive.

Q & A

Get to know...

Megan Gorham
Verification and Validation Lead

What did you work on prior to joining SGSS?

Before joining SGSS I worked on the TDRS-K project. I supported the TDRS-K and TDRS-L missions, developed the on-orbit test procedures for end-to-end test checkout, and managed the requirements verification and validation process.

What is your current role on the SGSS Project?

My role on the SGSS Project is the Verification and Validation Lead. I work with the Subject Matter Experts and Element Leads to review, approve, and track requirement verification.

What aspects of the project do you enjoy and look forward to the most?

I really enjoy working with the SGSS team. I look forward to refining and implementing the requirement approval process and expanding my SGSS ground system knowledge.

SGSS Q&A

Q1: When will missions have an opportunity to test with SGSS?

A1: SGSS has a few early test opportunities scheduled. We have already tested with some User Local Equipment loaned from the Terra project and are scheduled to work with the Fermi project in July 2016. If a project is interested in participating in early test opportunities prior to system deployment to White Sands, they should contact Vir Thanvi (vir.thanvi@nasa.gov).

Q2: How and where will the baseline interface for a mission be documented?

A2: The SGSS Project continues to refine its generic SGSS to End User interface control documents (ICDs) to capture details of the interface implementation for the full range of SGSS system capabilities – these capabilities include legacy Space Network (SN) service configurations and new configurations/capabilities available with SGSS. Early work on mission-specific ICD addenda was focused on clarifying legacy interface requirements and configurations to guide the SGSS Implementation Contractor's design/development efforts. Mission-specific ICD efforts now are a collaborative effort being performed by SGSS and the SN, in close coordination with the Networks Integration Management Office (NIMO) and the mission. These ICDs, once baselined, document the interface to which the SGSS system will be tested and verified at the time of the SGSS transition into the operational SN Ground Segment. Ownership of the Mission-specific ICDs will transfer to the SN after SGSS transition; this will enable the SN, NIMO and mission to perform ongoing ICD maintenance, and to implement future mission-desired evolution / service enhancements that are consistent with the full set of SN capabilities that include the delivered SGSS system.

SGSS Comings / Goings

We would like to recognize the hard work and effort of our team members who have left the project and also extend a warm welcome to all the newest members of the SGSS team.

Comings	Goings
Randall Brown	Andy Operchuck
Mike Chiville	Chris Yealy
Ted Drilling	
Tai Okwesa	
Alvin Robles	
Jacob Silva	
Bill Stark	
Eric Sudano	

In Memoriam

It is with deep sorrow that the SGSS Project and ESC community mourn the loss of Kevin McCarthy, who passed away unexpectedly on April 12th at the age of 54. NASA has lost an individual whose sense of mission and dedication to duty served as an inspiration. The world has lost a remarkable human being. Those of us who have been fortunate enough to know and work with Kevin will above all remember him for his thoughtfulness and extraordinary kindness. He will be greatly missed by all of us.

Kevin McCarthy

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